

UPS

Uninterruptible Power Supply

MT 3200



Instruction Manual

Item number: 022 / 03200MT-000

Januar 2010

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1 Presentation

In this instruction manual, the abbreviation UPS stands for Uninterruptible Power Supply.

The following pictograms are used in this instruction manual:



Denotes information which, if disregarded, poses a risk to health, functionality or safety.



Warning about the handling of batteries.

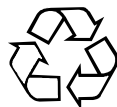


Warning about dangerous electrical voltage.



Hinweis

Denotes additional information and tips.



Recycling symbol



Denotes components that are governed by the electronic scrap ordinance.



Denotes components or parts that must be disposed of in a specific manner. Never throw these components into the regular refuse.

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2 Warranty conditions

The delivery receipt is considered to be the initial proof of purchase and should be stored carefully. It is required for all warranty claims. If the product is transferred to another user, then the latter is entitled to claim under the warranty for the remainder of the warranty period. The purchase receipt and this declaration should be transferred to the possession of the new owner.

We guarantee that this equipment is in a functional state and corresponds in technical terms to the descriptions in the enclosed documentation.

The warranty period for special equipment corresponds to the minimum period prescribed by legislation.

This warranty is not valid for the following cases:

- Defects due to: damage during transportation, accidents, natural disasters, misuse, vandalism, inappropriate use, maintenance errors or incorrect repairs by third parties.
- Modifications, unauthorised tampering, incorrect operation, another device or accessory, incorrect installation, or any modification not approved by us.
- Disregard for the instructions in the supplied documentation.
- Incompatibility of the product as a result of technical innovations or regulations that may come into effect after the purchase.
- Incompatibility or malfunction caused by product components not used by us.
- Signs associated with the normal ageing process of the product (wearing parts).
- Defects caused by external appliances.

The warranty period for parts replaced and/or repaired within the scope of this warranty expires with the original warranty for the product.

Equipment sent in without accessories will be replaced without accessories. Equipment returned will only be accepted if it is returned in the original packaging.

Incidental transportation costs are generally excluded from the provisions of the warranty.

EFFEKTA GmbH does not give any express or implied warranties in relation to this equipment and its quality, performance, merchantability or suitability for a specific purpose. In some countries, the exclusion of implied warranties is not permitted by law. In this case, the validity of all express and implied warranties is restricted to the warranty period. When this period expires, all warranties cease to be valid. In some countries, a limitation of the validity period of implied warranties is not permitted by law, in which case the above restriction is not effective.

2.1 Limitation of liability

Compensation claims are excluded unless they are based on deliberate acts or gross negligence of EFFEKTA GmbH or its employees. Liability under the Product Liability Act remains unaffected. Under no circumstances will we be held liable for:

- Claims for losses or damage made by third parties against you.
- Loss of or damage to your records or data or the cost of their recovery.
- Financial consequential damage (including loss of earnings or savings) or incidental damage, even in the event that we were informed of the possibility of such damage.

Under no circumstances whatsoever will EFFEKTA GmbH be held responsible for any coincidental, indirect, special, consequential or other damage of any kind (including, without limitation, damage relating to loss of profit, discontinuation of business, loss of business information or any other loss) arising from use of the equipment or in any connection with the equipment, whether based on a contract, compensation, negligence, strict liability, or other claims, even if EFFEKTA GmbH was informed in advance about the possibility of such damage. This exclusion also applies for any liability arising from claims of third parties against the initial purchaser.

In some countries, the exclusion or limitation of coincidental or consequential damage is not legally permitted, in which case the above declaration is not effective.

3 Safety

3.1 General safety instructions



Read and observe the user manual and safety instructions in this chapter before taking any further action (transportation, storage, connection, startup etc.).



Since the UPS equipment uses mains voltage and has a suitable energy accumulator (high-capacity batteries) installed either inside or outside the device, the instructions in this chapter are very important for all users and personnel. For this reason, appropriate safety instructions on the topic of batteries and battery packs are also dealt with here. When using external battery packs, you must also follow the safety instructions in the accompanying instruction manual.



Work on the UPS equipment may only be performed by authorised technical personnel.

3.2 Transportation and storage

The UPS may only be transported to its place of intended use in the original packaging. The same applies for removals or returns.

The equipment must not be transported or stored upside down.

Position the equipment securely during transportation taking its centre of gravity into account. Due to its weight, UPS equipment with integrated batteries may drop suddenly if its position shifts slightly.

When storing equipment, make sure that it is also securely positioned.

3.3 Setup

The UPS is intended for use in ventilated rooms.

During setup or installation, the installation location prescribed by the manufacturer must be observed.

There is a risk of condensation where the UPS is exposed to extreme and rapid temperature changes. Before taking any further steps, the equipment should be allowed to acclimatise for at least 2 hours.

Never set up or operate the equipment in a damp environment. Keep fluids away from the equipment.

The UPS must not be set up near heat sources.

Ensure that the vents of the equipment are not blocked and that the circulation of air is not impeded.

3.4 Connection

Only connect the UPS to an earthed shock-proof socket or, where a terminal clamp is used, be sure to connect the protective earth conductor. Under no circumstances should the equipment be operated without a protective earth conductor.

If an external bypass switch is used with the equipment, the connection instructions provided in the manual for the bypass switch are to be observed.

The house installation socket must be easily accessible and located in the vicinity of the UPS. In the case of a fixed connection, ensure that the shortest possible cable lengths are used.

Only a VDE-tested and CE-labelled mains cable may be used to connect the UPS to the house installation socket. In the case of a fixed connection, a suitable cable must be used.

Only use VDE-tested and CE-labelled electrical cables to connect the consumer load to the UPS. In the case of a fixed connection to the consumer load, a suitable cable must be used.

The fuse protection for the consumer load must always be installed directly in front of it, and never centrally in front of the UPS.

Do not operate any household appliances and power tools, e.g. fan heaters, vacuum cleaners, drills, hairdryers, toasters etc., via the UPS.

Do not connect any consumer loads to the UPS which could overload the equipment (e.g. laser printers).

The sum of the earth fault currents of all consumer loads connected to the UPS must not exceed 3.5mA.

Keep the connecting cables as short as possible and always lay these correctly. Avoid the dangers of laying connecting cables in locations where they may be tripped over, crushed or torn open etc.

3.5 Operation

The mains power cable must never be disconnected during the operation of the UPS, otherwise the protective earthing of the UPS and the connected consumer loads will be lost.

The UPS equipment contains an energy accumulator (batteries). This means that the output of the UPS may be live even if it is not connected on the line side.

To switch off the UPS completely, first press the switch on the front of the equipment (OFF position), wait until the UPS has switched off then disconnect

the power supply (switch off the mains input externally or disconnect the UPS from the mains, e.g. by unplugging it).

Make sure that no fluids or foreign bodies enter the UPS.

3.6 Handling batteries



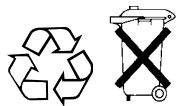
Warning – danger of electric shocks and burns.

Batteries can cause electric shocks and are capable of producing high short-circuit currents which can also inflict burns.

Unauthorised persons must be kept away from batteries.

Do not place batteries against heat sources and do not throw them into a fire as they might explode!

Do not open or destroy batteries. The electrolyte thereby released is extremely dangerous to persons and to the environment (danger of chemical burns to skin and eyes, toxic).



Defective batteries must be disposed of in an environmentally-friendly manner.

Never throw batteries into the regular refuse.

The local waste disposal regulations must be observed.

3.7 Maintenance, servicing and faults



Warning – danger of electric shocks.

The UPS remains connected to the battery circuit even after it has been disconnected from the mains power supply and has a dangerous voltage potential. Therefore always disconnect the battery circuit before carrying out servicing or maintenance work and make sure that the equipment is isolated from the supply.

Work on batteries may only be performed and monitored by personnel with appropriate technical knowledge about the required precautions.

Unauthorised persons must be kept away from batteries.

When working on the UPS, the following precautions must be taken:

- Remove wristwatches, rings and other metallic objects
- Only use electrically-insulated tools

The UPS must not be dismantled.

4 Introduction

This manual is intended to provide basic information about single-phase offline UPS equipment, namely the functional principle, use of the various functions and the procedure to follow in the event of faults. In addition, this manual contains information on transportation and storage as well as handling and installation of the UPS equipment.

The planning guidelines in this manual relate only to the specific requirements for UPS equipment. The national and local regulations for electrical installations must be followed without fail during installation.

The contents of the description for this equipment may change as a result of technological developments. Though we have endeavoured to make these contents as accurate and clear as possible, we would be grateful for information on any errors which are noted.

We accept no liability for errors in this description or their consequences.

The purpose of UPS equipment (Uninterruptible Power Supply) is to protect sensitive electrical devices such as computers, workstations, electronic points of sale, mission-critical instruments, telecommunications equipment, process controls etc. from faults which may arise as a result of poor power supply quality or even power failures. Sensitive devices such as these require comprehensive protection against electrical faults. These may be external faults (e.g. bad weather, operating faults) or faults caused by adjacent devices (e.g. motors, air conditioning units, processing machines, welding equipment etc.). The power supply faults may be summarised as follows:

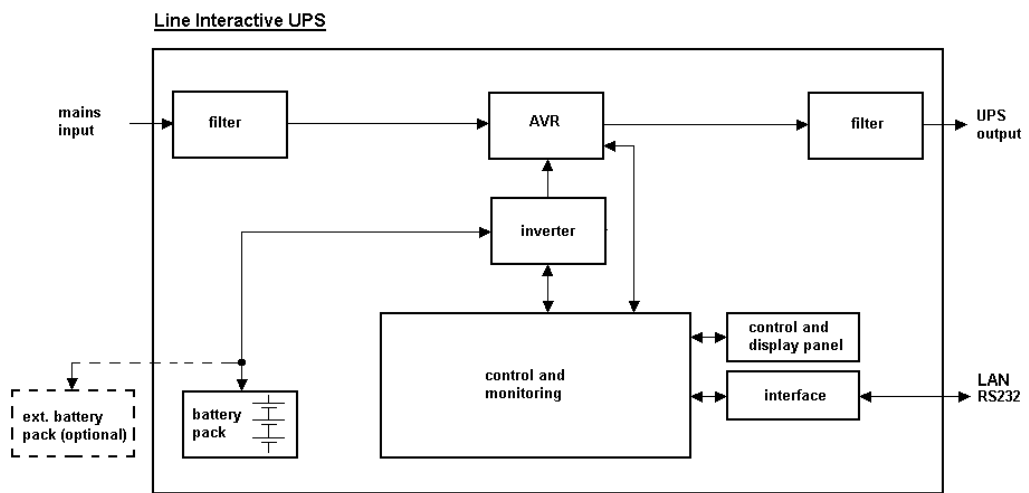
- Fast and slow line-voltage spikes and fluctuations;
- Mains power failure;
- Fast and slow frequency spikes and fluctuations;
- Mains heterodyning or transient voltages.

The UPS equipment monitors the power supply parameters described above using suitable countermeasures to protect the connected users (e.g. changeover to support operation in the event of temporary over- or under-voltage to protect the end devices).

5 System description

The UPS supplies an uninterrupted, single-phase voltage to users with mission-critical applications. In addition to supplying consumer loads, the equipment also keeps its internal batteries in a fully charged state. In the event of a power failure or power fault (e.g. voltage fluctuation), the UPS continues, without interruption, to deliver a clean voltage supply to the UPS output. In support mode, the energy is drawn from the battery pack.

Fig. 1:
Block diagram
MT series



The block circuit diagram shows the individual modules of the equipment and provides a general impression of how they interact.

If the mains power failure exceeds the bridging time of the UPS, it shuts down to prevent deep discharging of the batteries. When the mains power supply is restored, the UPS restarts automatically, supplies the consumer loads and controls the charging of the battery pack.

Outstanding performance characteristics of the RMT series are:

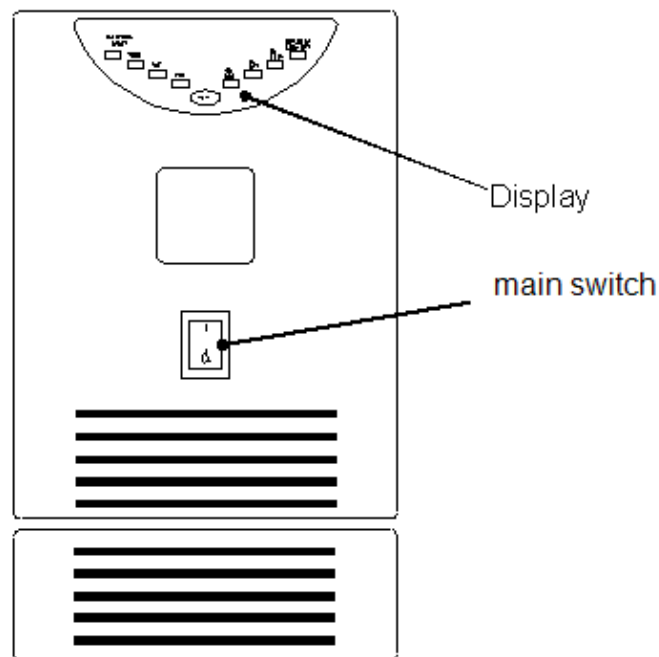
- Short changeover time to support operation in the event of primary mains supply failure.
- Genuine sine voltage from UPS output, low distortion factor;
- High-performance communications interface (RS232 interface);

6 Description of equipment –MT3200

In this chapter, you will be introduced to the various elements of the equipment and will be provided with instructions on its operation as well as all information on equipment connections.

6.1 Display and operator control elements on the front panel

Fig. 2:
Front view
MT3200



All of the operator control and display elements required for normal operation are positioned on the front of the equipment.

6.1.1 Operator control elements of the UPS

Fig. 3:
Display and
operator control
panel
MT3200





UPS "ON/OFF" switch:

This is used to switch the UPS on and off.



Providing the mains supply is still switched on, the charger also remains active once the UPS has been switched off.



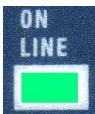
UPS "TEST" button (dual function):

When this button is pressed, the UPS changes from mains to support mode for approximately 10 seconds. This is a means of checking the function of the system and the batteries. If the UPS is already in support mode, the acoustic warning signal can be cancelled manually by pressing this switch (approx. 2 seconds) until the "Battery low" status is determined.

6.1.2 Display elements of the UPS



Generally, all indicator elements are only active when the UPS is switched on (main switch in "ON" position).



Line mode:

The UPS is operating using mains power. If the mains voltage tolerances have been exceeded or if the mains fails completely, this indicator goes out immediately. The same applies if a fuse at the mains input is disabled. The display flashes if mains voltage is present but the equipment is switched off.



Battery mode:

Support mode is active. The input mains power is not available or is outside the tolerances. The energy required to continue supplying the UPS output is drawn from the battery pack.



A.V.R. mode:

If an under- or over-voltage on the supply network is detected, the equipment switches to A.V.R. mode. To protect the users, the output voltage is reduced by 13% ("Buck" for over-voltage) or increased ("Boost" for under-voltage). The equipment continues to operate using mains power.



Battery low display:

Warning limit of the battery pack.

The LED indicates whether the remaining battery capacity has fallen below a fixed specified level during support mode. In on-line mode (charging of battery pack), the LED goes out once a sufficient charge level has been reached.

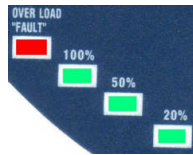


When "Battery low" is displayed in support mode, this is the latest point at which action must be taken to deal with the load through controlled shutdown of equipment. The support time which remains once this indicator comes on may be shorter than anticipated depending on the condition of the batteries (age and/or temperature).

Fault mode:

Operating fault in the UPS.

The indicator light goes on if an operating fault exists in the UPS or if a short-circuit develops at the UPS output.

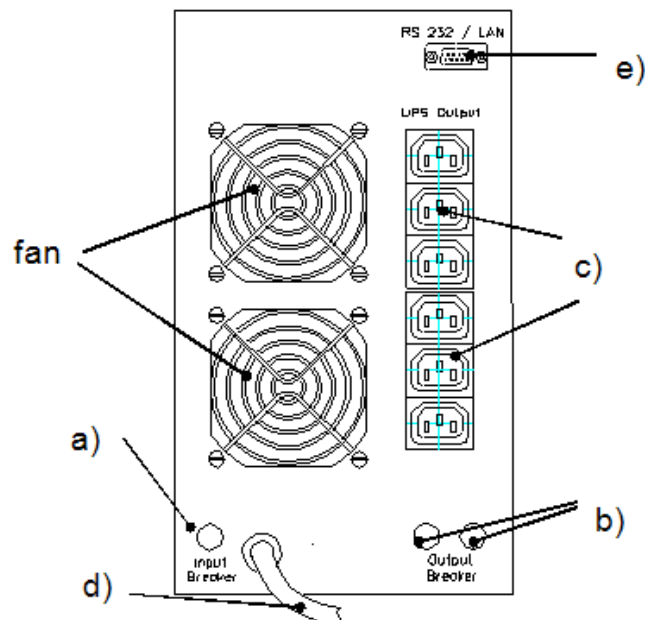
Load level:

Load status of UPS.

The display bar indicates the loading at the UPS output. If no load exists, the indicator bar goes out completely. As the load increases, the bar lights up starting at the bottom and moving up in 20, 50, 100% steps. If the red indicator light also comes on, then the UPS is overloaded ("OVERLOAD").

6.2 Equipment elements on the rear panel

Fig. 4:
Rear-panel view
MT3200

**Danger!**

All plug connections on the rear panel (with the exception of the communication interface) are on the mains power potential when connected.

Even when disconnected, dangerously high voltages may be present at the plug connections as a result of charged capacities inside the equipment.

Mains power input IEC 16A power plug for mains voltage.



Hinweis

The protective earth conductor must always be connected!

Please always observe the input voltage shown on the identification label or in the technical data of this manual.

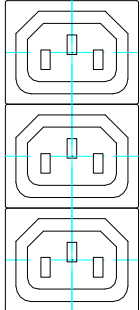
Safety cutout for mains input:

The safety cutout is triggered in the event of high overcurrents or an equipment defect (e.g. internal short-circuit) and the device is immediately disconnected from the connected mains power supply.

To simulate a power failure, simply pull out the power supply connector plug.



If all of the connections of the UPS already exist and the safety cutout is switched on, the charging unit is automatically active, i.e. the internal battery pack is already charged, without the UPS being started.



c) UPS output

Double socket (KG) in 2 groups of 2 pcs.

Two double sockets are protected by one safety cutout.



The protective earth conductor must always be connected!
Please always observe the max. possible power output of the equipment indicated on the identification label or in the technical data of this manual.



e) Communication
(9-pin D-Sub jack)

Via the serial interface (RS232), all of the relevant UPS data are transmitted to an appropriate primary control unit (e.g. PC). In addition, a defined shutdown signal can be sent to the UPS. Suitable software packages are available for this (see Software chapter).
In addition, the interface with the “mains power failure” and “low battery” contact signals (LAN) is assigned in such a way that these signals are available directly for processing.

Identification

The identification label contains information about the:

- # Manufacturer
- # Equipment model and output class
- # Equipment input values
- # Equipment output values
- # Item number
- # Serial number
- # CE and barcode designation

6.3 Audible alarm signals of the UPS



Support mode and high battery capacity:

The audible warning notification sounds in the following sequence **(A)**
[beep, beep -> long pause (8 s) -> beep, beep -> ..., repeating].



Support mode and low battery capacity:

The audible warning notification sounds in the following sequence **(B)**
[beep, beep -> short pause (1 s) -> beep, beep -> ..., repeating].



Operating fault or overload:

The audible warning notification sounds with a continuous tone, sequence **(C)**
[Beeeeeeeeeeeeee....p].

7 Storage and unpacking

7.1 Storing the UPS

If the equipment is not installed immediately, the following should be observed:

- The equipment and accessories must always be left in the original packaging and stored.
- The recommended ambient storage temperatures are: +5°C...+30°C.
- Protect the equipment and its packaging from moisture.
- If the anticipated storage period is longer than 4 months, the UPS and external battery pack (optional) must be operated for a period of approx. 8 hours to prevent deep discharging of the batteries.

7.2 Unpacking the equipment

Remove the shipping cartons and packaging material. Always store the equipment horizontally and never upside down.

Check the shipping note to make sure that the delivery is complete. If the delivery is incomplete or incorrect, inform the supplier immediately.

You should also check the delivery for transit damage. Any claims for transit damage must be made immediately:

- Retain the all shipping cartons and packaging material for verification purposes.
- Immediately inform the manufacturer or your supplier.
- Immediately inform the shipping company.

8 Installing and connecting the UPS

All requirements in the technical data regarding environmental and operating conditions must be observed to ensure trouble-free functioning of the UPS.

The following must be observed when setting up / installing the UPS equipment:

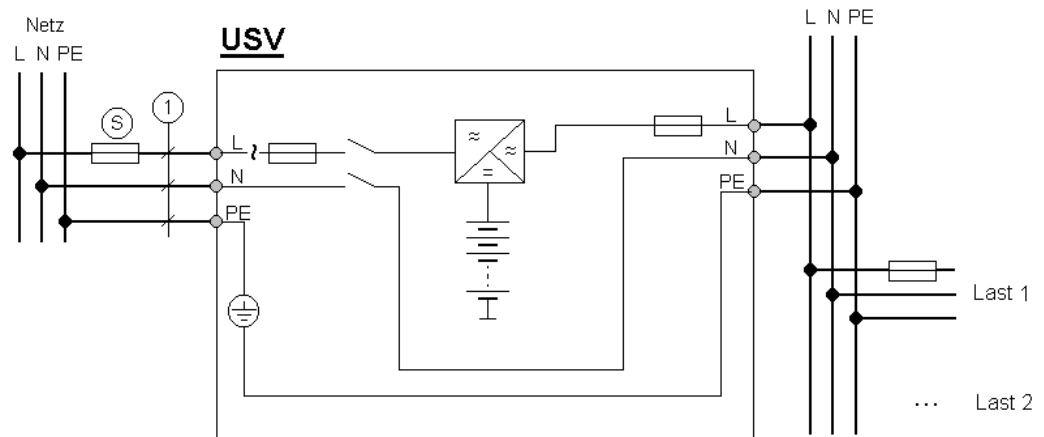
- Avoid extremes of temperature and atmospheric humidity. A maximum service life, particularly in relation to the batteries, is achieved at an ambient temperature of 15-25°C.
- Always ensure that sufficient space is available behind the UPS to make the necessary connections and, as the UPS is heavy, use suitable guide rails during installation. The load-bearing capacity of the support must be sufficient.
- Observe the specified installation location and only mount the equipment using the screw-in positions shown.
- Make sure that ventilation of the equipment is possible at all times. As this UPS is ventilated in a crosswise and lengthwise direction, a minimum clearance of at least 50mm between the UPS and the cabinet in which it is installed must be maintained at the sides as well as at the front and back. Ensure an appropriate flow channel.
- Make sure the equipment is arranged correctly. When installed in parent systems (e.g. machine, control cabinet), it must be ensured that the UPS operates within the specified temperature range. A sufficient level of forced ventilation must exist to remove excess heat that builds up in the space where the UPS is installed.

8.1 Connecting the UPS

The model is equipped with plug-type connections. The connection diagram (Fig. 5) and the following information must be observed:

Fig. 5:
Connection of
UPS and
consumer load

RMT3200	
S:	16 A
1:	1,5 mm ²



Warning

The UPS equipment contains components with high voltage and amperage. Incorrect handling may therefore result in electrical accidents which may have fatal consequences or cause material damage.



The protective earth conductor must always be connected! If not, the consumer loads will also not be earthed.



Warning

The connection diagram shown in Fig. 6 only applies if:

- the loop resistance is complied with up to the last consumer load;
- the earthing of the consumer loads is ensured;
- or that the consumer loads are separately protected against overcurrents and leakage currents, and are also earthed.



Hinweis

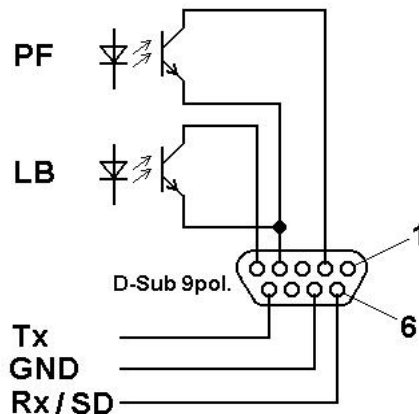
Please note that if the UPS equipment is in an emergency OFF circuit and this is activated, power will still be supplied to the UPS output. The consumer loads will continue to be supplied for the duration of the support time.

8.2 Communications connection of UPS

A convenient communications interface is available that facilitates data exchange with the UPS.

The connection should only be made using the cables specified in the "Accessories" chapter.

Fig. 6: Internal wiring of UPS communications interface



Pin:	Assignment:	
2	LAN	Signal: mains power failure
4	LAN	GND
5	LAN	Signal: battery low
6	RS232	Receive data (Rx) or shutdown (SD)
7	RS232	GND
9	RS232	Transmit data (Tx)



The communications interface is completely galvanically isolated. The LAN signals have a shared earth which is not connected to the RS232 earth.



The UPS can also be forced to shut down immediately during support mode via the RS232 serial interface. This is triggered via a permanent +12V signal on receive data (Rx) ("shutdown" function).

8.3 Connection sequence

Connect the UPS to the mains making sure that the mains and UPS are safely switched off beforehand.

Connect the consumer load(s) to the UPS. Ensure that all consumer loads are switched off.

Connect the communication port with your host computer using the cable supplied.

9 Operating and controlling the equipment

9.1 Operating the UPS equipment

The operation of this equipment is indicated by various operating modes and signals.

9.1.1 Operating modes and signals

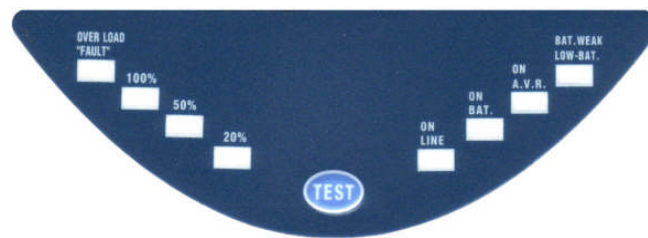
The most important operating modes of the UPS are:

Charging mode:

If the mains power is available and the line-side fuse or safety cutoff is switched on, the UPS is in charging mode.

-> The batteries are already charged, but the UPS has not yet been switched on.

Display/alarm signal: the ON Line indicator flashes.



Startup mode:

If the mains power is available, the startup procedure is initiated when the main switch on the front of the equipment is pressed, then on-line mode is automatically activated.

If no mains power is available during the startup procedure, the UPS switches directly to support mode following the startup procedure.

Display/alarm signal: the starting response is indicated by a short progress display or a flashing of the entire display. No audible alarm signal. The example below shows the A.V.R. operation phase with 50% load. The indicators for ON Line, ON A.V.R. and 50% output load indicators light up.

On-line mode:

if mains power is available and the UPS has completed the startup procedure, on-line mode is automatically activated.

-> If necessary, the battery pack is also charged in this operating mode.

Display/alarm signal: in on-line mode is indicated by the illumination of the ON Line display as well as the current value of the output load (here 50%). No audible alarm signal.

A.V.R. mode:

Within certain limits, A.V.R. mode compensates for over- or under-voltage in the power supply without drawing current from the batteries. This reduces the transfer voltage range at the UPS output compared to the mains power supply. The values are specified in the Technical Data.

Display/alarm signal: A.V.R. mode is indicated by the illumination of the ON Line and ON A.V.R display as well as the current value of the output load (here 50%). No audible alarm signal.

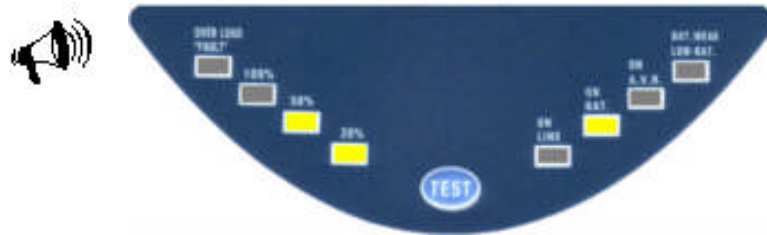


Support mode:

If the mains power fails, the UPS immediately switches to support mode.

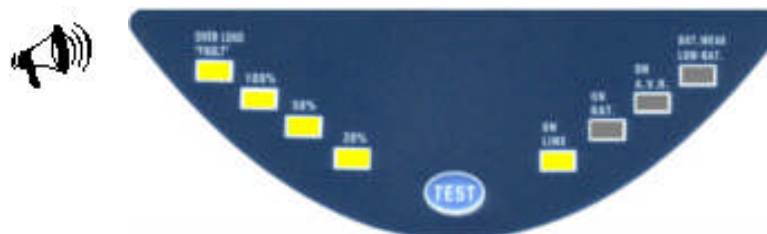
Display/alarm signal: support mode is indicated by the illumination of the “ON Bat” display and the load at the output (here 50% by way of example).

Sequence (A) is used as the audible alarm signal.

Overload mode:

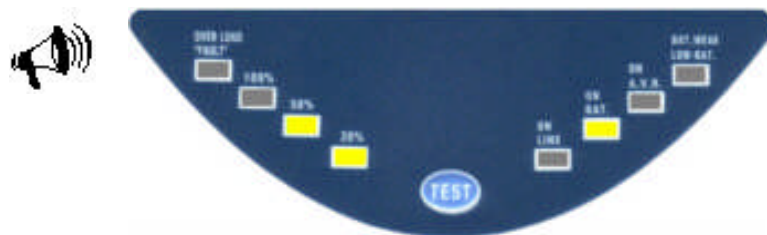
If the UPS output is overloaded, the UPS switches off after a short time interval (approx. 20 seconds). The UPS switches off immediately in the event of a short circuit on the output side.

Display/alarm signal: overload mode is indicated by illumination of the 100% output load indicator. Sequence (C) is used as the audible alarm signal. In addition, the “ON Line” indicator here shows available mains power.

Test mode:

If the UPS is in on-line mode, test mode can be initiated by pressing the “TEST” button.

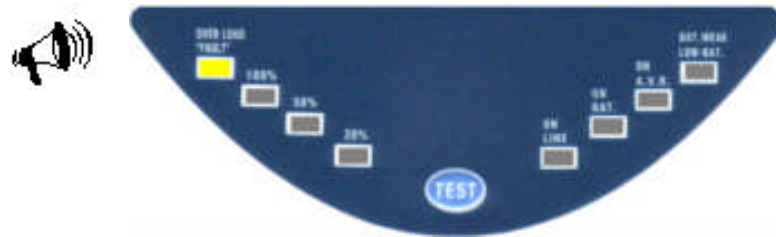
Display/alarm signal: the display (including the alarm signal) is the same as in support mode, although mains power is available.



Fault mode:

If a fault develops in the equipment, the UPS immediately switches to fault mode. This switches off the load at the output. This operating mode can then only be reset by powering down the UPS completely.

Display/alarm signal: in fault mode the fault indicator lights up. Sequence (C) is used as the audible alarm signal.



9.2 Instructions for using the UPS



The operator of this UPS equipment must always comply with the instructions in this manual. The operator may only carry out the following and must exercise extreme care when doing so:

- Use of the operator control elements: Switching the UPS on and off.
- Reading the display elements and interpretation of the audible alarm signals.
- Activation of test mode.
- Use of communications interface, whereby a connection to the PC or other systems must already exist for UPS equipment with a fixed connection.

Owing to the comprehensive protection functions which the UPS equipment assures in relation to the user(s), the UPS runs completely autonomously. Only the switching-on and switching-off is performed by the operator. In addition, data can be exchanged via the communications interface but this is not absolutely necessary for the general operation of the equipment.

9.2.1 Switching on the UPS

To switch on the UPS, press the ON/OFF switch on the front side of the UPS. The UPS now arrives at the appropriate operating mode following completion of the start-up sequence.

9.2.2 Switching off the UPS

The UPS is switched off using the ON/OFF switch. The UPS remains in charging mode to keep the batteries fully charged and ready for operation.



The UPS can only be fully deactivated by disconnecting it completely from the mains power supply.

9.2.3 Activating test mode



Before activating test mode, you should observe the following:

- Inform all employees concerned about your intended action.
- As a safety precaution, back up all the data of your connected consumer loads.

- Leave all consumer loads switched on so that the load characteristic remains unchanged.
- Ensure that the UPS is in on-line operating mode.

Press the “TEST” button (and keep it pressed down for approx. 1 second). The UPS then switches to test mode for approximately 10 seconds.



This operating mode is only used to test the function of the UPS. In this mode the battery capacity indicator only provides a rough indication of the battery pack charge status. This does not necessarily reflect the total capacity of the battery pack or the overall support time it can provide.

9.2.4 Communication

Software packages are required to facilitate the exchange of data between the UPS and a parent system. The range of features can be found in the “Software” chapter.

10 Starting up the UPS equipment

To guarantee error-free startup, the following actions must be carried out:

1. Check the line-side fuse then connect the equipment to the power supply.
2. Switch the UPS on (main switch on the front of the equipment).
3. Wait until the UPS is in on-line mode.
4. Now connect the consumer loads one by one, observing the load indicator.



Hinweis

If all of the steps have been completed successfully, the UPS will be in on-line mode and the load indicator will be less than 100%.

5. Now switch the system off (main switch on the front of the equipment).
6. Wait a few seconds ("refresh").
7. Switch the UPS on again (main switch on the front of the equipment).



Hinweis

The UPS equipment should revert to on-line mode after a few seconds. This test ensures that the system will also start when the total load is connected.

The equipment can now remain ready for operation in this state.

11 Troubleshooting



Troubleshooting on the UPS equipment may only be performed by authorised technical personnel.

If the UPS does not work properly, try to resolve the problem by referring to the following table:

Problem	Possible cause:	Remedy:
The UPS cannot be started and no alarm signal is given.	Mains power is not available to the UPS or is switched off.	Ensure that all connections have been established and verify this by means of appropriate voltage measurements. Check the line-side fuse for the UPS.
The UPS is in overload mode, the overload indicator is illuminated, and an audible warning notification sounds (sequence (C)).	The consumer load(s) are overloading the UPS.	Disconnect one or all of the consumer loads from the UPS until the load indicator is less than or equal to 100%.
The bridging time is less than the rated value.	The batteries are not fully charged, or individual batteries are defective.	Charge the batteries for more than 8 hours and repeat the test. If the problem persists, the batteries must be replaced.
The UPS appears to be OK, but the consumer load is not operating.	The connection between the UPS and the consumer load is defective.	Check the connection and confirm it by measuring the voltage.
	The output fuse is not enabled.	Check the UPS output fuse. Confirm this via an additional voltage measurement at the UPS output.

If the fault profile you are experiencing with your UPS is not described in the above table, inform our service department making sure you have the following information to hand:

1. Model number, serial number
2. Date on which the problem occurred
3. Detailed description of the problem

12 Software

The settings and operating statuses of the UPS can be determined and processed further using the communications interface in combination with a suitable software package. The software packages may be obtained from the manufacturer / dealer or via the service hotline (see “Service” chapter) where you can obtain useful information about suitable software packages for your application and UPS. For more information, you can also visit our Internet home page:

<http://www.effekta.com/>

The following basic functions are supported by all software packages:

- Detection and display of the UPS mains power status;
- Display of the UPS output status;
- Detection and display of the battery pack charge status;
- Closing down of running applications in the event of a mains power failure;
- Shutdown of the operating system;
- Creation of log files;
- General monitoring of UPS data and status (diagnosis function).

For more details on individual software packages – such as information on installation, operation and the range of features – please consult the software manual.



You will find a suitable tried-and-tested software package in the “Accessories” chapter.

13 Maintenance and servicing

You can expect a long service life and trouble-free operation from your UPS equipment as long as you ensure that the necessary minimum level of maintenance is carried out. However, the reliability of the UPS is also significantly affected by environmental conditions. The temperature and atmospheric humidity of the surroundings must be kept within the limits. In addition, the area around the UPS must be kept as clean and free of dust as possible. At the ideal ambient temperature of 22°C, the typical service life of the batteries is approx. 4 years, but this service life can be substantially increased (to approx. 8-10 years) by using special batteries.

You should check at regular intervals (every 6-12 months) to ensure that the remaining bridging time is sufficient for your intended purposes. If this is not the case, then it is time to replace the batteries.

13.1 Measuring the bridging time (support time)



Before starting this procedure, it is absolutely essential to save all open data. Also inform all employees concerned.

There are essentially two methods of measuring the support time. Method a) is suitable for measuring the actual support time, whereby the consumer loads will inevitably have zero current at the end of the bridging time. Method b) enables the residual capacity to be determined after a specific support time, whereby consumer loads will not generally be left with zero current.

To apply one of the named methods, force the UPS into support mode by switching off the mains power supply.

After performing the measurement, switch the mains power supply back on and start the UPS as normal using the main switch.



Hinweis

Bear in mind that after the measurement the batteries will be discharged, i.e. the on-line/charging mode must have been active in the UPS equipment for several hours (min. 5 hours) before they are approx. 80% operational again.

If the support time is not measured due to local conditions or directives, we recommend replacing the batteries every two years as a preventive measure to avoid the risk of inadequate support time due to battery deterioration.

13.2 Replacing the batteries



Before you proceed, take the safety information provided into consideration. Carry out the work in the specified sequence. Always use safety tools. Before you start work, make sure that the UPS is switched off and is disconnected from the mains power supply.



Work on the battery pack may only be carried out by technical personnel who have received specific training in the handling of batteries.



Note that high voltages remain in the equipment even when it is switched off. This includes the voltage in the battery pack and the charging voltages in mains capacitors, for example. Appropriate safety measures must be taken to prevent electric shock.

Owing to the dangers described above, no further details are provided in this manual on the replacement of batteries.

13.3 Service log

Enter all maintenance and servicing work performed on the UPS equipment into the service log.

[illegible]

13.4 Service hotline

In the unfortunate event that problems occur with the UPS or if you require safety-relevant information, please contact our service hotline on the following phone or fax numbers:

Tel. no.: 0049 / (0) 7542 –9353-0

Fax no.: 0049 / (0) 7542 – 9353-300

If it is not possible for you to get in touch by telephone, we have set up an e-mail contact address for you:

ups@effekta.com

In addition, you can contact the department or subsidiary you need directly via the following Internet address:

<http://www.effekta.com/html/kontakt.html>

13.5 Maintenance and service contracts

EFFEKTA Regeltechnik GmbH offers you tailored maintenance and customer services that ensure the highest possible reliability and availability of your UPS equipment.

In addition, as part of a maintenance contract, our expert technical personnel can provide you with support in the following areas:



- Regular checking of the equipment, especially the batteries, as well as timely replacement and disposal of batteries;



- Checking of the UPS installation;



- Disposal of defective or deteriorated components;



- Environmentally-friendly disposal of batteries.

Our entire range of services is presented at:

<http://www.effekta.com/html/service.html>

or alternatively, you may contact us directly at the above addresses.

14 Technical Data

14.1 Equipment specifications

Model:		MT3200
Power:		3200 VA / 2000 W
Mains power input:	Phases	1 phase conductor + neutral conductor
	Input range	171 – 278 V AC
	Rated frequency	50 / 60 Hz
	Synchronous range	45 – 65 Hz
	Boost (+13%)	yes
	Buck (-13%)	yes
UPS output:	Transfer voltage (on-line mode)	200 – 250 V AC
	Rated voltage (support mode)	230 V AC (sine +/-6%)
	Max. output current	13,9 A
	Overload capacity	[110 ... 130 %]: 10 – 25 s, > 130 % 1,5 s
	Bridging time	approx. 8 min under rated conditions
Efficiency:	AC -> AC	> 95 %
DC input	Input voltage	48V DC (rated)
Interface:	LAN / RS232	9-pin D-SUB jack (galvanically isolated)
Environmental data:	Perm. temp. range	0 ... + 40 °C
	Recommended temp.	+15 ...+ 25 °C
	Storage temperature	0 ... +40 °C
	Rel. atmos. humidity	0 ... 90% (non-condensing)
Normen:		EN 50091-1, EN 50091-2
General	Cooling	Fan cooling
	Noise level	< 45 dB
	Weight	43 kg
	Inspections	TÜV / GS / CE
Dimensions	H x W x D [mm]	290 x 160 x 530 mm

14.2 Accessories

Below is a list of components that have been specifically tested and approved for this UPS by EFFEKTA Regeltechnik GmbH:

Accessory:	Function:	Item number:
"PowerShut Plus" software package	Network-capable shutdown and diagnosis software	LAN PowerShut
LAN/RS232 connection	Interface connection cable	M2502

14.3 List of wearing parts

The following components are subject to normal wear and tear and are therefore not covered by the warranty for this UPS:

Wearing part:	Function:	Item number:
XXXX XX XX ** Battery 12 V 7 Ah	Energy accumulator	Depending on equipment; see accessories or on request

** For wearing parts designation, see fitted batteries. This can also be obtained on request.

15 Requirements for the declaration of conformity

The CE-labelled UPS equipment complies with the following harmonised standards and EC guidelines:

EC guideline:	73/23/EEC (for devices operating within a restricted voltage range) 93/8/EEC – supplement to guideline 73/23/EEC 89/336/EEC – guideline on electromagnetic compatibility 92/31/EEC – supplement to EMC guideline 89/336/EEC
Standards:	EN 50091-1 EN 50091-2



An EC declaration of conformity for CE-labelled products may be obtained on request from the following address:

EFFEKTA Regeltechnik GmbH
Klausenburgerstrasse 9
88069 Tettnang, Germany

Tel. no.: 0049 / (0) 7542 –9353-0